

## Modelling Viking Era Water Ice Clouds

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Water ice clouds in the Martian atmosphere are increasingly becoming recognized as a potentially important aspect of the water cycle and potentially potent mechanism for climate change. In particular, it has been suggested that water ice cloud formation can control the extent of the water column (Kahn, 1990). Further, water ice cloud formation may scavenge dust out of the atmosphere and may prevent cross-equatorial water transport, especially in the northern summer (Clancy, 1996).

To address these questions, a combination of modelling and data analysis can be used. The Viking era water ice clouds were identified (Tamppari et al., 1998) from the IRTM data set. Following that, Tamppari et al. (1999) attempted to identify the cloud opacity and temperature using a 1D, 2-layer ice and dust cloud model. However, data fits were sensitive to the surface temperature, dust opacity and temperature, and ice particle mode radius value, as well as the water ice cloud temperature and opacity. This resulted in an underconstrained problem.

A Mars GCM will be employed to provide realistic atmospheric conditions as a function of season, latitude, and longitude. The non-unit surface emissivities (Christensen, 1998) will be added and synthetic IRTM brightness temperatures will be calculated. Results of the comparison of the synthetic and measured brightness temperatures will be presented.